Trend Study 25A-14-04

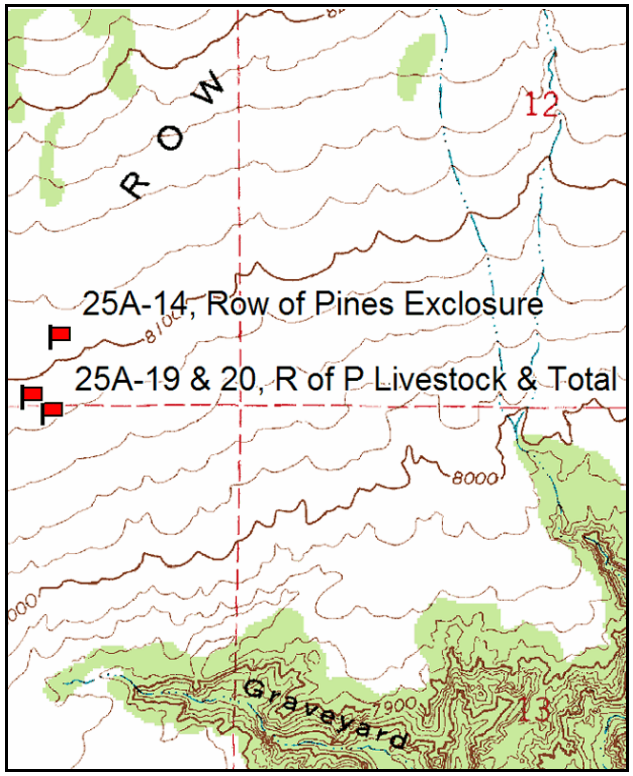
Study site name: Row of Pines Exclosure . Vegetation type: Wyoming Big Sagebrush .

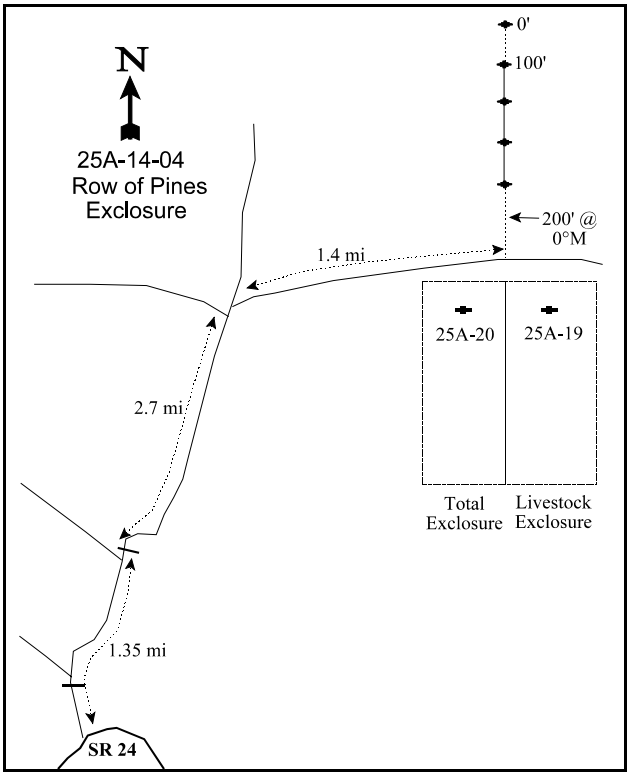
Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the Chappell Cheese Factory northwest of Loa on SR 24, go west 2.6 miles to a side road on the north where the highway makes a sharp turn (0.95 miles west of mile marker #49). Take this road 0.65 miles and turn right after crossing a cattleguard. After 0.7 more miles, turn right at the fork and cross another cattleguard. Go 2.7 miles to another fork where you will again turn right. After ~60', turn right (east) and go 1.4 miles to an exclosure. Stop at the middle of the exclosure and walk 200 feet at an azimuth of 0°M to the 400' stake. The 0' stake is 400 feet to the north in front of a large rock.





Map Name: Loa, Utah

Diagrammatic Sketch

Township 27S , Range 2E , Section 14

GPS: NAD 27, UTM 12S 4258045 N, 442732 E

DISCUSSION

Row of Pines Exclosure - Trend Study No. 25A-14

The Row of Pines Exclosure study was established in 1991 just outside of the exclosure. The exclosure was built in the late 1980's by the BLM and DWR after the area was chained and seeded. It samples a sagebrush-grass type that was chained and seeded. The site has a slight slope of 3% to 5% with a south aspect. The area is within the BLM Sevenmile allotment which allows cattle grazing for approximately 20 days in May. Cattle sign and tracks were found in the area in 1991. Deer sign and remains were also found in 1991 and pellet group data estimated 21 deer days use/acre (52 ddu/ha). Large amounts of sage grouse droppings were also encountered on the area during study site establishment in 1991. Pellet group data from the site in 1999 estimated 29 deer, 15 elk and 15 cow days use/acre (72 ddu/ha, 37 edu/ha, 37 cdu/ha). Cattle pats were from the previous year. In 2004, 76 deer, 3 elk, and 4 cow days use/acre (190 ddu/ha, 7 edu/ha, 11 cdu/ha) were estimated. Deer and elk use was from the winter. Sage grouse pellet groups were sampled with about 35 pellet groups/acre. Escape cover is about a half mile from the transect.

Soil depth is moderately shallow with an estimated effective rooting depth of just over 11 inches. Texture is a sandy clay loam to a loam with a neutral pH (7.0). Soil parent material is basalt. Phosphorus is marginal at 8.5 ppm. Values less than 10 ppm may limit normal plant growth and development. The soil surface is a combination of pavement and bare ground with some evidence of soil erosion. However, due to the lack of slope, water erosion is not currently a significant problem in this area. Wind erosion could be more of a concern.

The dominant browse species is Wyoming big sagebrush which had a density of 6,399 plants/acre in 1991. This declined by 13% in 1999 to 5,580 plants/acre and declined again in 2004 by 14% to 4,780 plants/acre. Most of the population has been mature or decadent with each reading. Decadency increased in 2004 to 42% from 27 and 29% in the previous readings. Seedlings and young have only been found in low numbers. The percent of the population classified as dying has been higher than the percent young in each of the last readings. There have not been enough young plants within the population to replace the dying plants. Sagebrush cover has declined from 13% in 1999 to 11% in 2004. Utilization has been moderate to heavy since 1991.

The only other common shrubs are undesirable increasers, narrowleaf low rabbitbrush and broom snakeweed. Narrowleaf low rabbitbrush density was lower in 1999, which was probably due to the much larger sample used in 1999 which gives more accurate density estimates for browse populations with discontinuous distributions. Since 1999, density appears to be stable at about 1,100 plants/acre. Broom snakeweed increased from 6,066 plants/acre in 1991 to 10,000 by 1999, then decreased to only 1,420 plants/acre in 2004.

Seeded grasses, crested wheatgrass, smooth brome, and Russian wildrye, have become established since the chaining, but in low numbers. The dominant grasses have been blue grama and bottlebrush squirreltail. Blue grama abundance has been stable, but cover declined sightly in 2004 because of summer drought. Bottlebrush squirreltail and crested wheatgrass nested frequency declined significantly in 2004. Forb composition and abundance is poor with all forbs combined providing less than 1% cover. The only common species encountered in 1999 was low fleabane and was not sampled at all in 2004.

1991 APPARENT TREND ASSESSMENT

With the high amount of pavement and rock, the soil is basically stable. The disturbance due to chaining caused only slight erosion, with much of the erosion likely caused by wind and not water. Forbs on the site are not abundant or diverse. The major forage species is Wyoming big sagebrush which is in good condition.

1999 TREND ASSESSMENT

Trend for soil is stable to improving. Percent cover of bare ground has declined while litter cover has also gone down. Rock and pavement cover have increased. Erosion does not currently appear to be a problem on this site. Trend for browse is down slightly. The key species, Wyoming big sagebrush, has a fairly stable population. However, 14% (760 plants/acre) of the population were classified as dying. The proportion of young plants in the population has declined from 15% in 1991 to only 6% currently. There are not enough young plants to replace decadent/dying individuals. Seedlings are rare. Utilization has remained moderate to heavy. Another negative aspect of the browse trend is the increase in density and size of broom snakeweed. It currently has a mostly mature population of 10,000 plants/acre. Trend for the herbaceous understory is up slightly. Sum of nested frequency of perennial grasses and forbs has increased slightly since 1991. However, composition is poor with the low growing blue grama providing 73% of the grass cover and 68% of the herbaceous cover. This would point to excessive late spring grazing of the cool season species by livestock. Seeded grasses did not establish well and remain at low numbers. Forbs are lacking.

TREND ASSESSMENT
soil - up slightly (4)
browse - down slightly (2)
herbaceous understory - up slightly (4)
winter range condition (DC Index) - 48 (fair to good) Wyoming big sagebrush type

2004 TREND ASSESSMENT

The trend for soil is down slightly. Percent relative bare ground increased from 20% to 31% in 2004. Vegetation cover decreased, while rock and pavement have remained fairly stable. The slight slope keeps erosion from being a problem. The browse trend is slightly down. Wyoming big sagebrush density declined 14% after a 13% decline in 1999. Percent decadence is higher than it has previously been at 42%, with 19% of the population classified as dying. There are still too few young plants to replace the dying plants. Positively, broom snakeweed density and cover decreased. Density declined from 10,000 plants/acre in 1999 to 1,420 plants/acre. The trend for the herbaceous understory is down. Sum of nested frequency for perennial grasses declined 39%, while cover decreased from 9 to 6%. The warm season species, blue grama is the most dominant, which is an indication of overgrazing during the spring. Forbs are rare and have also declined 67% in sum of nested frequency since 1999.

TREND ASSESSMENT
soil - slightly down (2)
browse - slightly down (2)
herbaceous understory - down (1)
winter range condition (DC Index) - 32 (fair) Wyoming big sagebrush type

HERBACEOUS TRENDS --
Management unit 25A, Study no: 14

Type	Species	Nested Frequency			Average Cover %	
		'91	'99	'04	'99	'04
G	Agropyron cristatum	[b]32	[b]36	[a]7	.22	.06
G	Bouteloua gracilis	122	149	150	6.48	4.82
G	Bromus inermis	4	9	3	.07	.03

Type	Species	Nested Frequency			Average Cover %	
		'91	'99	'04	'99	'04
G	Elymus junceus	$_{a}$1	$_{b}$19	$_{ab}$10	.18	.21
G	Oryzopsis hymenoides	33	18	18	.11	.10
G	Sitanion hystrix	$_{b}$135	$_{b}$152	$_{a}$47	1.73	.46
G	Stipa comata	2	1	-	.00	-
Total for Annual Grasses		0	0	0	0	0
Total for Perennial Grasses		329	384	235	8.83	5.70
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F	Androsace septentrionalis (a)	-	$_{b}$12	$_{a}$-	.02	-
F	Arabis demissa	2	-	3	-	.15
F	Astragalus lentiginosus	4	6	16	.01	.03
F	Chenopodium fremontii (a)	-	-	2	-	.15
F	Chenopodium leptophyllum(a)	-	-	3	-	.03
F	Descurainia pinnata (a)	-	4	5	.01	.04
F	Eriogonum ovalifolium	7	3	-	.18	-
F	Erigeron pumilus	$_{b}$7	$_{c}$63	$_{a}$-	.38	-
F	Phlox longifolia	12	5	4	.01	.01
F	Sphaeralcea coccinea	$_{b}$13	$_{ab}$5	$_{a}$4	.02	.01
Total for Annual Forbs		0	16	10	0.03	0.21
Total for Perennial Forbs		45	82	27	0.61	0.21
Total for Forbs		45	98	37	0.64	0.43

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 25A, Study no: 14

Type	Species	Strip Frequency '99	Strip Frequency '04	Average Cover % '99	Average Cover % '04
B	Artemisia frigida	5	3	-	-
B	Artemisia tridentata wyomingensis	93	89	13.11	11.14
B	Chrysothamnus viscidiflorus stenophyllus	31	31	.45	.47
B	Eriogonum microthecum	0	0	-	-
B	Gutierrezia sarothrae	96	45	3.20	.27
B	Opuntia fragilis	14	20	.19	.06
B	Pediocactus simpsonii	1	2	-	-
Total for Browse		240	190	16.96	11.96

CANOPY COVER, LINE INTERCEPT --
Management unit 25A, Study no: 14

Species	Percent Cover '04
Artemisia tridentata wyomingensis	9.55
Chrysothamnus viscidiflorus stenophyllus	.41
Gutierrezia sarothrae	.71
Opuntia fragilis	.08

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 25A, Study no: 14

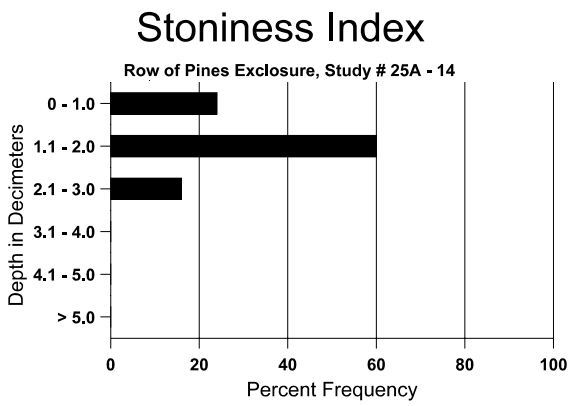
Species	Average leader growth (in) '04
Artemisia tridentata wyomingensis	1.4

BASIC COVER --
Management unit 25A, Study no: 14

Cover Type	Average Cover %		
	'91	'99	'04
Vegetation	4.00	25.65	18.32
Rock	11.50	13.64	13.11
Pavement	23.00	29.28	26.68
Litter	27.00	18.03	21.06
Cryptogams	0	.24	.13
Bare Ground	34.50	21.60	34.99

SOIL ANALYSIS DATA --
Management unit 25A, Study no: 14, Study Name: Row of Pines Exclosure

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
11.2	57.7 (11.0)	7.0	47.3	27.4	25.3	1.6	8.5	163.2	0.6



PELLET GROUP DATA --
Management unit 25A, Study no: 14

Type	Quadrat Frequency	
	'99	'04
Rabbit	34	45
Grouse	-	2
Elk	5	3
Deer	16	29
Cattle	3	4

Days use per acre (ha)	
'99	'04
-	-
-	-
15 (37)	3 (7)
29 (72)	77 (190)
15 (37)	4 (11)

BROWSE CHARACTERISTICS --
Management unit 25A, Study no: 14

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Artemisia frigida												
91	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**200**	-	20	180	-	-	20	40	-	-	0	4/6
04	**60**	-	-	60	-	-	0	67	-	-	0	3/3
Artemisia tridentata wyomingensis												
91	**6399**	800	933	3733	1733	-	40	36	27	.31	2	7/9
99	**5580**	60	340	3620	1620	620	45	17	29	14	14	13/24
04	**4780**	360	80	2700	2000	1500	44	22	42	19	19	13/25
Chrysothamnus viscidiflorus stenophyllus												
91	**3266**	66	533	2000	733	-	45	31	22	-	2	4/6
99	**1100**	-	20	820	260	-	7	0	24	9	9	4/9
04	**1060**	60	60	900	100	-	8	0	9	6	6	5/11
Eriogonum microthecum												
91	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**0**	-	-	-	-	-	0	0	-	-	0	4/6
Gutierrezia sarothrae												
91	**6066**	266	1600	4133	333	-	14	11	5	.32	1	2/2
99	**10000**	520	1000	8780	220	500	0	0	2	1	1	7/8
04	**1420**	-	20	1400	-	-	0	0	0	-	0	5/8
Opuntia fragilis												
91	**0**	66	-	-	-	-	0	0	0	-	0	-/-
99	**540**	-	40	480	20	-	0	0	4	4	4	2/8
04	**720**	-	40	680	-	-	0	0	0	-	0	2/7
Pediocactus simpsonii												
91	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**20**	-	20	-	-	-	0	0	-	-	0	-/-
04	**40**	-	-	40	-	-	0	0	-	-	0	1/2